

AMENDMENTS TO THE CLAIMS

Please amend Claim 44 to read as follows. Note that all the claims currently pending in this application, including those not presently being amended, have been reproduced below for the Examiner's convenience.

1-11. (Cancelled)

12. (Previously Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive refractive power,
a second lens unit of negative refractive power,
a third lens unit of positive refractive power, and
a fourth lens unit of positive refractive power, zooming from a wide-angle end to a telephoto end being effected by moving said second lens unit toward the image side, and shifting of an image plane due to zooming being compensated for by moving said fourth lens unit,

wherein said second lens unit consists of four lenses including three negative lenses and one positive lens, and at least one of said four lenses is an aspherical lens, and wherein the zoom lens satisfies the following condition:

$$1.28 < |R24/R25| < 3.20$$

where R24 and R25 are radii of curvature of the fourth and fifth lens surfaces, respectively, when counted from the object side, in said second lens unit.

13. (Previously Amended) A zoom lens according to claim 12, wherein said second lens unit consists of, in order from the object side to the image side,

a negative first lens having a concave surface of larger curvature facing the image side than that of an opposite surface thereof,

a bi-concave negative second lens,

a positive third lens having a convex surface of larger curvature facing the object side than that of an opposite surface thereof, and

a bi-concave negative fourth lens.

14. (Original) A zoom lens according to claim 12, wherein said aspherical lens is said third lens.

15. (Original) A zoom lens according to claim 12, satisfying the following condition:

$$0.25 < |f_2/f_A| < 0.41$$

where

$$f_A = \sqrt{f_w \cdot f_t}$$

wherein f_2 is a focal length of said second lens unit, and f_w and f_t are focal lengths in the wide-angle end and the telephoto end of said zoom lens, respectively.

16. (Original) A zoom lens according to claim 12, satisfying the following conditions:

$$36 < v_n < 65$$

$$20 < v_p < 35$$

where v_n is a mean Abbe number of materials of negative lenses which constitute said second lens unit, and v_p is a mean Abbe number of materials of positive lenses which constitute said second lens unit.

17. (Original) A zoom lens according to claim 12, satisfying the following condition:

$$1.71 < N_n < 1.95$$

where N_n is a mean refractive index of materials of negative lenses which constitute said second lens unit.

18. (Original) A zoom lens according to claim 12, satisfying the following condition:

$$0.79 < |R_{22}/f_2| < 1.32$$

where R_{22} is a radius of curvature of the second lens surface, when counted from the object side, in said second lens unit, and f_2 is a focal length of said second lens unit.

19. (Cancelled)

20. (Original) A zoom lens according to claim 12, satisfying the following condition:

$$0.98 < |R_{26}/R_{27}| < 3.55$$

where R_{26} and R_{27} are radii of curvature of the sixth and seventh lens surfaces, respectively, when counted from the object side, in said second lens unit.

21-22. (Cancelled)

23. (Previously Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,

a second lens unit of negative optical power, said second lens unit moving to the image side for zooming from the wide-angle end to the telephoto end,

a third lens unit of positive optical power, and

a fourth lens unit of positive optical power, said fourth lens unit moving during zooming,

wherein said third lens unit has, in order from the object side to the image side, a positive lens having an aspherical surface and a negative meniscus lens having a convex surface facing the object side, and

wherein said second lens unit has three negative lenses and one positive lens.

24. (Previously Amended) A zoom lens according to Claim 23, satisfying the following condition:

$$0.24 < |f_2/f_A| < 0.33$$

where

$$f_A = \sqrt{f_w \cdot f_t}$$

wherein f_w and f_t are focal lengths at the wide-angle end and the telephoto end of the entire zoom lens, and f_2 is the focal length of said second lens unit.

25. (Previously Amended) A zoom lens according to Claim 23, satisfying the following condition:

$$0.86 < |f_3/f_A| < 1.09$$

where

$$f_A = \sqrt{f_w \cdot f_t}$$

wherein f_w and f_t are focal lengths at the wide-angle end and the telephoto end of the entire zoom lens, and f_3 is a focal length of said third lens unit.

26. (Previously Amended) A zoom lens according to Claim 23, wherein said fourth lens unit moves during focusing, and the following condition is satisfied:

$$0.40 < \beta_{4T} < 0.55$$

wherein β_{4T} is the magnification at the telephoto end of said fourth lens unit with an object at infinity.

27. (Cancelled)

28. (Previously Amended) A zoom lens according to Claim 23, satisfying the following conditions:

$$36 < v_n < 65$$

$$20 < v_p < 35$$

where v_n is the mean Abbe number of the materials of the negative lenses that constitute said second lens unit, and v_p is the mean Abbe number of the material of the positive lens which constitutes said second lens unit.

29. (Previously Amended) A zoom lens according to Claim 23, satisfying the following condition:

$$70 < N_n < 1.95$$

where N_n is the mean refractive index of the materials of the negative lenses that constitute said second lens unit.

30. (Previously Amended) A zoom lens according to Claim 23, wherein said second lens unit comprises, in order from an object side to an image side,

a first negative lens having a concave surface of stronger optical power on the image side than on the object side,

a second negative lens both surfaces of which are concave,

a first positive lens having a convex surface of stronger optical power on the object side than on the image side, and
a third negative lens, both surfaces of which are concave.

31. (Previously Amended) A zoom lens according to Claim 30, satisfying the following condition:

$$0.82 < |R22/f2| < 1.07$$

where R22 is the radius of curvature of the second lens surface counted from the object side of said second lens unit and f2 is the focal length of said second lens unit.

32. (Previously Amended) A zoom lens according to Claim 30, satisfying the following condition:

$$1.66 < |R24/R25| < 4.00$$

where R24 and R25 are the radii of curvature of the fourth lens surface and the fifth lens surface, respectively, counted from the object side, of said second lens unit.

33. (Previously Amended) A zoom lens according to Claim 30, satisfying the following condition:

$$1.00 < |R26/R27| < 1.46$$

where R26 and R27 are the radii of curvature of the sixth lens surface and the seventh lens surface, respectively, counted from the object side, of said second lens unit.

34. (Previously Amended) A camera comprising:
a zoom lens according to Claim 23; and
an image pickup element, said image pickup element receiving an image
formed by said zoom lens.

35. (Cancelled)

36. (Previously Amended) A zoom lens comprising, in order from an object
side to an image side,

a first lens unit of positive optical power,
a second lens unit of negative optical power, said second lens unit moving
during zooming,
a third lens unit of positive optical power, and
a fourth lens unit of positive optical power, said fourth lens unit moving during
zooming,

wherein said third lens unit has a positive lens, both surfaces of which are
aspherical, and

wherein said second lens unit has three negative lenses and one positive lens,
said zoom lens satisfying the following condition:

$$0.86 < |f3/fA| < 1.09$$

where

$$fA = \sqrt{fw \cdot ft}$$

wherein f_w and f_t are focal lengths at the wide-angle end and the telephoto end of the entire zoom lens, and f_3 is a focal length of said third lens unit.

37. (Previously Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,

a second lens unit of negative optical power, said second lens unit moving

during zooming,

a third lens unit of positive optical power, and

a fourth lens unit of positive optical power, said fourth lens unit moving during zooming,

wherein said third lens unit has a positive lens, both surfaces of which are aspherical,

wherein said second lens unit has three negative lenses and one positive lens,

wherein said fourth lens unit moves during focusing, and

wherein the following condition is satisfied:

$$0.40 < \beta_{4T} < 0.55$$

wherein β_{4T} is the magnification at the telephoto end of said fourth lens unit with an object at infinity.

38. (Previously Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,

a second lens unit of negative optical power, said second lens unit moving during zooming,

a third lens unit of positive optical power, and

a fourth lens unit of positive optical power, said fourth lens unit moving during zooming,

wherein said third lens unit has a positive lens, both surfaces of which are aspherical,

wherein said second lens unit has three negative lenses and one positive lens, and

wherein said second lens unit comprises, in order from an object side to an image side,

(a) a first negative lens having a concave surface of stronger optical power on the image side than on the object side,

(b) a second negative lens both surfaces of which are concave,

(c) a first positive lens having a convex surface of stronger optical power on the object side than on the image side, and

(d) a third negative lens, both surface of which are concave,

said zoom lens satisfying the following condition:

$$1.66 < |R24/R25| < 4.00$$

where R24 and R25 are the radii of curvature of the fourth lens surface and the fifth lens surface, respectively, counted from the object side, of said second lens unit.

39. (Cancelled)

40. (Previously Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive refractive power,

a second lens unit of negative refractive power,

a third lens unit of positive refractive power, and

a fourth lens unit of positive refractive power, zooming from a wide-angle end to a telephoto end being effected by moving said second lens unit toward the image side, and shifting of an image plane due to zooming being compensated for by moving said fourth lens unit,

wherein said second lens unit consists of four single lenses including three negative lenses and one positive lens,

wherein for the third lens in order from the object side of said four single lenses, a surface of the object side is an aspherical surface, and

wherein the following condition is satisfied:

$$0.25 < |f_2/f_A| < 0.41$$

where

$$f_A = \sqrt{f_w \cdot f_t}$$

wherein f_2 is a focal length of said second lens unit, and f_w and f_t are focal lengths in the wide-angle end and the telephoto end of said zoom lens, respectively.

41. (Previously Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive refractive power,

a second lens unit of negative refractive power,
a third lens unit of positive refractive power, and
a fourth lens unit of positive refractive power, zooming from a wide-angle end to a telephoto end being effected by moving said second lens unit toward the image side, and shifting of an image plane due to zooming being compensated for by moving said fourth lens unit,

wherein said second lens unit consists of four lenses including three negative lenses and one positive lens, and at least one of said four lenses is an aspherical lens,
wherein the zoom lens satisfies the following condition:

$$0.25 < |f2/fA| < 0.41$$

where

$$fA = \sqrt{fw \cdot ft}$$

wherein $f2$ is a focal length of said second lens unit, and fw and ft are focal lengths in the wide-angle end and the telephoto end of said zoom lens, respectively.

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42. (Previously Amended) A camera comprising:

a zoom lens according to Claim 12; and
an image pickup element, said image pickup element receiving an image formed by said zoom lens.

43. (Previously Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,

a second lens unit of negative optical power, said second lens unit moving during zooming,

a third lens unit of positive optical power, and

a fourth lens unit of positive optical power, said fourth lens unit moving during zooming,

wherein said third lens unit has, in order from the object side to the image side,

a positive lens having an aspherical surface and a negative meniscus lens having a convex surface facing the object side, and wherein said second lens unit has three negative lenses and one positive lens, and

wherein the following condition is satisfied:

$$0.24 < |f_2/f_A| < 0.33$$

where

$$f_A = \sqrt{f_w \cdot f_t}$$

wherein f_w and f_t are focal lengths at the wide-angle end and the telephoto end of the entire zoom lens, and f_2 is the focal length of said second lens unit.

44. (Currently Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,

a second lens unit of negative optical power, said second lens unit comprising three negative lenses and one positive lens, and at least one of said three negative lenses and one positive lens being an aspherical lens,

a third lens unit of positive optical power, said third lens unit comprising a positive lens with an aspherical surface, said positive lens being closest to the object side of any lens in said third lens unit, and

a fourth lens unit of positive optical power, said fourth lens unit comprising a cemented lens, said cemented lens being made of a positive lens and a negative lens, the negative lens of said cemented lens being cemented with the image side of the positive lens of said cemented lens,

wherein said second lens unit moves to the image side for zooming from the wide-angle end to the telephoto end, said third lens unit does not move for zooming, and said fourth lens unit moves for zooming.

45. (Previously Added) A camera comprising:

a zoom lens according to claim 44; and
an image pickup element, said image pickup element receiving an image formed by said zoom lens.